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NEW SPECIES OF ACARINA.

BY H. E. EWING.

(Plates XIII.-XVI.)

In this paper 15 new species of Acarina are described. They are distributed into 12 genera and 8 families. One of the species, *Raphignathus tessellatus*, is the first representative of the genus *Raphignathus* to be found in America; another, *Neophillobius harti*, is the second representative of the genus to be found in this country. The members of the first named genus are especially characterized by the uniformly reticulate integument on the dorsal surface of the body. The members of the second genus are noted for the great length of the legs, which may almost be compared to the *Phalangidæ*. One species, *Gymnobates longus* belongs to the only genus of the family *Oribatidæ* peculiar to this country. The genus *Gymnobates* was first described by Nathan Banks. It is characterized by the fact that the pteromorphæ are attached to the cephalothorax as well as the abdomen.

The writer is indebted to the following persons for the collection of some of the species described in the following pages: Mr. C. A. Hart, of the Illinois State Laboratory of Natural History; Mr. J. Douglas Hood, a specialist in the study of Thysanoptera; Mr. James Zetek and H. Glasgow, both students of the University of Illinois.

In each case the species have been described from specimens mounted on microscope slides, which method is most advantageous because of the small size of the specimens. The drawings have been made with the aid of an Abbé Camera Lucida. In order to make the paper more complete the writer has given the characters of the different genera and families.

Fam. EUPALIDÆ.

No specialized setæ on cephalothorax arising from a pore on the postero-lateral aspect; integument not leathery or chitinated; palpi composed of three or five segments, not geniculate but ending in a large, stout claw; mandibles ending in one claw; eyes absent or only a single pair present.

Gen. **EUPALUS** Koch.

Palpi composed of three segments, without spine-like bristles; one pair of eyes present.

Only one species described.

Eupalus pectinatus n. sp.

(Plate XIII., Figs. 1, 2.)

Pale red.

Cephalothorax not distinctly demarcated from abdomen. Anterior bristles simple, situated about one-half their length from the anterior margin of the cephalothorax. They are about as long as segment two of palpus; posterior bristles small, almost erect, in the usual position. This species is peculiar in that it possesses a long, pectinate, specialized seta arising from a pore situated in a funnel-shaped organ at the postero-lateral aspect of abdomen. This structure is apparently the same as that found in the *Oribatidæ*. Mandibles slightly longer than the palpi, hairless from above and ending in a claw. Segment one of palpus small; segment two about two-thirds as long as mandibles; segment three rudimentary and ending in a powerful, stout, outer claw and a stout inner spine. Segment two bears four similar, simple bristles on its dorsal surface; segment three has two outer bristles, the posterior is much the longer.

Abdomen pyriform; posterior end truncate. The abdomen has several small bristles, including about half a dozen at the posterior margin.

Leg one about as long as abdomen; tarsus three times as long as the tibia. The last two pairs of legs are much stouter than the first two pairs. Claws of last two pairs of legs twice as long as those of the two anterior pairs of legs. The tarsi have at their tips, besides the claws, caruncles, which are peculiar in consisting of three subequal prongs. Legs all sparsely clothed with hairs of different lengths.

Length, 0.38 mm.; breadth, 0.25 mm.

In moss. Collected by the writer at Mahomet, Illinois.

Fam. **CRYPTOGNATHIDÆ**.

Body plainly divided into cephalothorax and abdomen.

Palpi without true thumb, never geniculate; mouth parts small; last segment to the first pair of legs usually shorter than the penultimate segment; tarsi without suckers. Eyes usually present. Mandibles chelate.

Gen. **CALIGONUS** Koch.

Anterior pair of legs about equal to the other pairs; femora

of hind legs not swollen; mandibles rather small. One pair of eyes present.

One species.

***Caligonus cardinalis* n. sp.**

(Plate XIII., Figs. 3, 4.)

Bright red; legs somewhat paler than the body.

Cephalothorax small and almost twice as broad as long. Beak about as long as the cephalothorax. There is a single pair of eyes situated at the extreme postero-lateral aspect of the cephalothorax. Beak hairless. Mandibles sharp, pointed, each with two subequal bristles near the middle of the outer margin. Palpi large, about twice as long as the beak; second segment the longest; third segment three-fifths as long as segment two; fourth segment two-thirds as long as third; distal segment very small, rudimentary. All the segments of the palpi bear a few simple bristles except the proximal one; segment four has on its distal margin a small, chitinous hook; segment five is armed at its distal end with two large, stout bristles, which are inclined inwards and apparently are adapted for grasping and holding prey.

Abdomen almost twice as long as broad; bearing two prominent, slightly curved, simple, shoulder bristles, somewhat longer than the width of leg one, two pairs of somewhat longer, sharply recurved bristles are situated at the anterior margin of abdomen; the inner pair being about one-half its length from the median plane; a pair of bristles is situated near the middle of the dorsal surface of the abdomen and very near the median plane. There is a row of five bristles on each side of the abdomen about one-half the distance from the median plane to the lateral margin; two pairs of bristles are situated near the tip of the abdomen; the inner straight, and situated slightly above the lateral margin; the outer curved and situated slightly below the lateral margin. Anus at the tip of the abdomen and slightly ventral in position; just behind it are two small short, stout bristles.

Legs subequal in length; first pair of legs slightly shorter than the length of the body; distal segment of leg one, one and one-half times as long as penultimate segment. All the segments of the legs have approximately the same width, excepting the basal segment, which is somewhat broader than the rest. Claws of legs bidactyle, with a small narrow caruncle between the dactyles. Tarsus of each leg terminating in a few long, simple bristles; tarsi of legs one and two broad at the tip; tarsi of legs three and four not broadened at the tip.

Length, 0.38 mm.; breadth, 0.20 mm.

In moss. Collected by the writer at Urbana, Illinois. Many specimens.

Fam. TETRANYCHIDÆ.

Palpi free; tarsi never ending in suckers; body with a division between cephalothorax and abdomen. Last segment of palpus ending in a thumb; skin without shields; coxæ of legs arranged more or less into two groups; hairs on the body usually arranged into four longitudinal rows. Many of the members of this family spin threads, hence they are called the "spinning mites."

Gen. **RAPHIGINATHUS** Dugés.

No projecting tubercles from the anterior margin of the cephalothorax; body subglobose; hairs of the body arranged in four longitudinal rows. Legs moderately short. The skin of the dorsal surface is tessellated by having many small thickened, elevated areas.

Representatives of this genus are very common in Europe. The following species is the first of the genus to be recorded from America.

Raphignathus tessellatus.

(Plate XIII., Figs. 5, 6.)

Red; body completely covered with small, darker, areas arranged like mosaic work. These areas are all of about the same size but are very irregular in shape; between them is a network of light yellowish red integument. Legs graulate.

Cephalothorax composing one-half of the body and similar to the abdomen in shape; anterior margin oval. A single pair of eyes is present near the side of the cephalothorax, between legs one and two. The cephalothorax bears four pairs of stout, stiff, slightly clavate bristles arranged around the outer margin. Mandibles less than one-half as long as the palpi; second segment of palpus three-fifths as broad as long, broader at the proximal than at the distal end; third segment as broad as long; fourth segment half as long again as third segment and ending in a stout, slightly curved claw; thumb short, cylindrical, two-thirds as broad as long and not extending to the tip of the palpal claw. Palpi apparently hairless from below; above, segment two bears one large, slightly curved and slightly pectinate bristle; segment three has a very long bristle near its middle; segment four with at least three bristles; thumb with several bristles.

Abdomen similar in shape to cephalothorax, excepting the middle part of the posterior margin, which is almost straight. Abdomen bearing seven pairs of stout, stiff, slightly clavate bristles; two inner

rows of four bristles each; two bristles on each lateral margin; and two pairs of bristles on the posterior margin, those of the outer pair being the largest.

Legs short; anterior pair about three-fifths as long as the body; second pair of legs three-fourths as long as anterior pair; third pair of legs equal to second pair; last pair of legs subequal to the anterior pair. All the legs are sparsely clothed with stout, slightly curved spines; tarsus and tibia of leg one each with a rather long tactile bristle. Tarsi with stout claws about one-third as long as the tarsal segments.

Length, 0.46 mm.; breadth, 0.32 mm.

In moss. Collected by the writer at Mahomet, Illinois. Four specimens.

Gen. **NEOPHYLLOBIUS** Berlese.

Cephalothorax without tubercles at the anterior margin; body broad, short, and bearing very large bristles; all the legs much longer than the body.

A single species.

Neophyllobius harti n. sp.*

(Plate XIV., Fig. 7.)

Body brownish red blotched with patches of black; legs and palpi pale red; integuments finely striated.

There is apparently no division between the cephalothorax and the abdomen. From the anterior part of the body projects a shelf-like expansion which partially conceals the mouthparts; this may be called the epistoma. The epistoma is about three-fifths as broad as long, being broadest at the base and oval in front. The mandibles project slightly beyond the epistoma; palpi one and one-half times as long as the epistoma and extending beyond the mandibles. Each palpus ends in a stout claw and has also a thumb, which is about as long as the palpal claw. Each palpus bears about a half dozen bristles of varying length.

Body oval; two-thirds as broad as long and bearing about two dozen large, stout plumose spines, each of which is situated upon a small tubercle. From the anterior margin of the body extend two bristles, one along either side of the epistoma and equal to it in length; six bristles are situated at the posterior margin of the body.

Legs very long; anterior pair twice as long as the body; second pair of legs about one-half as long as the anterior pair; third pair two-thirds

* Named in honor of C. A. Hart, systematic entomologist of the Illinois State Laboratory of Natural History.

as long as the anterior pair; fourth pair equal to the first pair. Tarsus of leg one about two-fifths as long as the tibia; tibia two-fifths as long as the entire leg; antepenultimate segment very short, about one-third as long as tarsus. Each of the legs bears a few short bristles; none of the segments swollen.

Length, 0.64 mm.; breadth, 0.44 mm.

In moss. Collected by C. A. Hart at Carbondale, Illinois. One specimen.

This species differs from *N. americanus* Banks in many ways. The second pair of legs instead of being equal to the anterior pair are not over one-half as long! None of the tarsi are swollen in this species as in *N. americanus* and none of the legs have a long tactile bristle.

Fam. RHYNCHOLOPHIDÆ.

Palpus never geniculate or fitted for grasping prey, but provided with a thumb at the distal end; body well clothed with hairs; coxæ arranged in groups; cephalothorax on the same plane with the abdomen; mandibles styliform.

Gen. RHYNCHOLOPHUS Dugés.

Palpi large, composed of five segments; mouth parts not retractile; dorsal groove prominent; tarsus of leg one sometimes swollen.

Two species.

Key to species.

Palpi about equal in length to the mandibles**tumidus.**
 Palpi about twice as long as the mandibles.....**longipalpus.**

Rhyncholophus tumidus n. sp.

(Plate XIV., Fig. 8.)

Uniform bright red; sparsely clothed with short clavate bristles; legs clothed with longer, simple bristles.

Cephalothorax not demarcated from abdomen; median groove extending as far as the eyes, expanded into a small triangular area posteriorly, from which extends two simple bristles fully one-half as long as the entire length of the groove; anteriorly the groove is continued into a small tubercle as broad as high, from which extends four prominent bristles each about one-third as long as the mandibles. A single pair of eyes is present above the second pair of legs. Mandibles as long as the palpi. Second segment of palpus one-half as broad as long; third segment broader than the second, about two-thirds as

broad as long ; distal segment scarcely equal to the third in length and ending in a weak claw ; thumb rather small.

Abdomen two-thirds as broad as long, rounded posteriorly.

Anterior pair of legs almost as long as the body ; tarsus swollen ; two-thirds as long as tibia ; tibia not so long or as broad as antepenultimate segment. Second pair of legs about two-thirds as long as the anterior pair ; tarsus slightly swollen. The tarsus of leg four is very much swollen, about three-fifths as broad as long and about one-half as long as tibia. Claws situated on short pedicels.

Length, 1.22 mm. ; breadth, 0.80 mm.

Under dead clover and grass. Collected by J. D. Hood at Urbana, Illinois. Two specimens.

***Rhyncholophus longipalpus* n. sp.**

(Plate XIV., Fig. 9.)

Body red with dark blotches ; legs and palpi paler than the body.

Cephalothorax truncate in front, as broad as long ; dorsal groove extending beyond the eyes. At the posterior end of the dorsal groove are two long bristles, each about two-fifths as long as the cephalothorax. At the anterior end of the dorsal groove is a broad, low tubercle from which extend five long, subequal bristles. A single pair of eyes is present, situated on the postero-lateral aspect of the dorso-vertex about an equal distance from the lateral and the posterior margins of the same. Palpi large, longer than the cephalothorax and nearly twice as long as the mandibles ; second segment of palpus twice as long as broad ; third segment about two-thirds as long as the second segment ; fourth segment ending in a single stout claw. Thumb cylindrical, not extending beyond the palpal claw.

Abdomen truncate posteriorly, broadest at the anterior margin and sparsely clothed with almost straight pectinate bristles.

Legs very long ; anterior pair about twice as long as the body ; second and third pairs of legs subequal, being about three-fourths as long as the anterior pair ; posterior pair of legs equal to the anterior pair. Tarsus of leg one much swollen, one-half as broad as long and almost as long as the tibia ; tibia subequal to antepenultimate segment. Tarsus of leg four slightly swollen and about one-half as long as the tibia. Legs two and three also have swollen tarsi.

Length, 0.38 mm. ; breadth, 0.26 mm.

Under bark of willow. Collected by the writer at Urbana, Illinois. One specimen. One other individual was seen, but I was unable to capture it.

Fam. TROMBIDIIDÆ.

Palpi free, the last segment being transformed into a thumb, the preceding segment ends in a stout claw. Body without shields; eyes present; coxæ not radiate but arranged in two groups. Body thickly clothed with hairs, cephalothorax much reduced in size; mandibles chelate.

Gen. **MICROTROMBIDIUM** Haller.

Palpi ending in two claws instead of one, as is the case of the members of the other genus of the family.

A single species.

Microtrombidium nigrum n. sp.

(Plate XIV., Figs. 10, 11.)

Body black, clothed with pectinate bristles; legs and palpi red; abdomen constricted at about one-third its length from the cephalothorax.

Cephalothorax small, narrow; two-thirds as broad as long; two eyes on each side of cephalothorax, situated on a short stalk, common to both. Hairs on cephalothorax fewer and longer than those on the abdomen; median groove prominent. Mandibles one-half as long as the palpi. Segment two of palpus almost as long as the mandibles; segment three about three-fifths as broad as long; segment four ending in two black claws, the outer being much the larger. This species has large thumbs, longer than segment four of the palpus and slightly swollen.

Abdomen almost as broad posteriorly as anteriorly; strongly constricted slightly in front of the middle; no elevated area on the dorsal part of the posterior region.

Legs long; anterior pair as long as the entire body; tarsus of leg one not swollen, as long as the penultimate segment; penultimate segment equal to antepenultimate. All the legs are sparsely clothed with hairs similar to those of the abdomen but somewhat longer. Claws of tarsi large and rather slender; those of the first pair of legs about one-half as long as those of the other legs.

Length, 1.90 mm.; breadth, 1.12 mm.

Under bark of a hickory tree. Collected by James Zetek at Danville, Ill.

Fam. ORIBATIDÆ.

° Cephalothorax with a specialized seta on each side above, arising from a large pore near the posterior margin. Integument hard, well chitinized. Abdomen with chitinous wing-like expansions called pteromorphæ. Mouth parts small, often invisible from above.

Key to genera described in this paper.

1. Abdomen with some large spatulate bristles on the dorsum. **Pelops.**
 Abdomen without spatulate bristles..... 2.
2. Tarsus of leg one broadened distally..... **Gymnobates.**
 Tarsus of leg one tapering distally 3.
3. Lamellæ narrow, attached to the dorsal surface of the cephalothorax by their inner margins..... **Oribata.**
 Lamellæ very large, attached to the dorsal surface of the cephalothorax by their posterior margins only **Oribatella.**

Gen. **PELOPS** C. L. Koch.

Some of the setæ on the dorsum of abdomen large, spatulate; integument frequently rough; mandibles broad at the base but suddenly becoming narrow and terminated by minute chelæ. A large rectangular projection from the anterior margin of the abdomen usually present.

One species.

Pelops latipilosus. n. sp.

(Plate XV., Fig. 12.)

Chestnut brown; integument slightly rugose.

Cephalothorax small, the posterior part hidden by a rectangular projection from the anterior margin of the abdomen. Lamellæ almost as long as the cephalothorax, about one-half as broad as long, the outer margin strongly convex, the inner free margin strongly concave; trans-lamellæ a mere ridge; lateral lamellæ present, similar to the lamellæ in shape but longer. There is a large, stout pair of tectopodia present for the protection of the first pair of legs. The cephalothorax bears two pairs of prominent bristles; a large, long, lanceolate pair situated on the posterior dorso-lateral aspect, which are almost as long as the cephalothorax itself, directed forwards and curved towards the median plane; and a much smaller, slightly curved serrated pair situated on the sides of the rostrum; directed outwards. Pseudostigmatic organs about as long as tibia of leg one, clavate with rugose heads.

Abdomen fully two-thirds as broad as long; pteromorphæ one-half as long as abdomen, truncate in front. When the mite is walking the pteromorphæ are so expanded as to present a view of their whole external surface from above, but upon the slightest provocation they are instantly drawn in close to the body and then entirely hide the legs. There is a broad, rectangular projection extending from the anterior margin of the abdomen, from each anterior corner of which projects an enormous, spatulate bristle, fully as long as the cephalothorax and projecting beyond the tip of the rostrum; at its broadest part

it is broader than the width of the femur of leg one. The abdomen bears at least eight other pairs of spatulate bristles, but they are of about the usual size. There are two bristles situated just above each pteromorpha; two on each side of the median line at the posterior margin of the abdomen, one pair on the postero-lateral margin just in front of these; two situated almost touching each other at the middle of each lateral half of the dorsum and a single bristle situated about one-half the distance from these two to the anterior margin of the abdomen. Genital and anal covers subequal; genital covers situated approximate to the anterior margin of ventral plate; anal covers situated their length from the genital covers and three-fourths their length from the posterior margin of the ventral plate.

Legs rather short; tarsus and tibia of leg one subequal. Each leg bears several large, stout, slightly curved serrate bristles. Unguis tridactyle; dactyles unequal.

Length, 0.54 mm.; breadth, 0.42 mm.

Under hickory bark. Collected by H. Glasgow at Urbana, Illinois. Three specimens.

Gen. **GYMNOBATES** Banks.

Pteromorphae long, extending beyond the anterior margin of the abdomen, and attached to the cephalothorax; claws tridactyle; tarsus of leg one broad at the tip.

One species. This is the second to be recorded in this genus.

Gymnobatus longus n. sp.

(Plate XV., Figs. 13, 14.)

Pale, yellowish brown; integument of medium thickness, surface smooth.

Cephalothorax long and narrow. The situation of the lamellae is peculiar in this species. The true lamellae are situated laterally. They are very long and narrow, about two-thirds as long as the cephalothorax, and their posterior ends, or the bases of the lamellae, are situated below the attachment of the pteromorphae to the cephalothorax. The inner lamellae are indicated by two very short ridges situated at the posterior part of the cephalothorax; a very long, narrow translamella connects their anterior ends. There is a posterior pair of very long, pectinate bristles situated just in front of the transmella. The lateral, true lamellae each bears a long, slightly curved, pectinate bristle, about as long as the lamella from which it extends. Pseudo-stigmatic organ with a small, short peduncle and a large, globose head.

Abdomen about one-half as broad as long; pteromorphae very long, about as long as abdomen and extending from behind the middle of

abdomen to almost the middle of cephalothorax. Genital opening almost round; situated about three times its length in front of the much larger anal opening. Anal opening broader posteriorly than anteriorly, situated almost approximate to the posterior margin of ventral plate.

Anterior pair of legs about two-thirds as long as abdomen; distal end of tarsus broad, this is only true, however, in the case of tarsus one; tarsus two-thirds as long as tibia. Femur of leg two bearing laterally a long, chitinous blade, the anterior cusp of which is as long as the genual of same leg. Legs bearing three equal claws.

Length, 0.48 mm.; breadth, 0.24 mm.

Under a log. Collected by the writer, Arcola, Illinois. Two specimens.

Gen. **ORIBATA** Latr.

Body with smooth integument; pteromorphæ attached to abdomen only; claws tridactyle; lamellæ attached to the cephalothorax for almost the entire length of their inner margin.

Four species.

Key to the species described.

1. Pseudostigmatic organs pectinate 2.
Pseudostigmatic organs simple, smooth 3.
2. Femora of legs with blade-like expansions on their inner margins. **laminata.**
Femora of legs without blade-like-expansions **subaquila.**
3. Translamella present **figurata.**
No translamella present **clavata.**

Oribata laminata n. sp.

(Plate XV., Figs. 15, 16.)

Light brown; surface of integument smooth.

Cephalothorax long and narrow; lamellæ about three-fifths as long as cephalothorax, without cusps and very narrow; translamellæ absent. There is a large pair of tectopodia for the protection of coxa one. Lamellar hairs somewhat longer than lamellæ, straight and directed forwards; interlamellar hairs similar to lamellar hairs but more erect. Anterior lateral hairs pectinate, about as long as lamellæ, curved markedly towards the median plane. Pseudostigmatic organ with short, slightly recurved peduncle and enlarged, oblong head. Palpi prominent.

Abdomen twice as long as broad; pteromorphæ truncate, not extending beyond the anterior margin of abdomen and attached to the anterior one-half of the lateral line of the same. Genital covers twice as long as broad, situated about twice their length in front of the larger

anal covers. Anal covers almost approximate to posterior margin of ventral plate. Abdomen hairless.

Anterior pair of legs almost as long as abdomen; tarsus and tibia subequal. This species is remarkable in that all the femora possess a chitinous, blade-like expansion. This chitinous blade is slightly crescent shaped, without cusps and is attached to the whole length of the femur. Unguis tridactyle.

Length, 0.44 mm.; breadth, 0.22 mm.

Under bark. Collected by the writer at Urbana, Illinois. A single specimen.

Oribata figurata n. sp.

Plate XV., Figs. 17, 18.)

Light brown; surface of integument smooth.

Cephalothorax as broad as long; lamellæ three-fourths as long as cephalothorax, about the same width throughout; lamellar cusps prominent; translamellar a mere ridge. Lateral lamellæ present, about three-fifths as long as cephalothorax, curved towards the median plane. Prominent, stout tectopodia for first pair of legs. Lamellar hairs straight, pectinate, about one-half as long as the lamellæ from which they extend; interlamellar hairs approximate to the posterior margin of the dorso-vertex and similar to the lamellar hairs, but about twice as long as the same, directed forwards; anterior lateral hairs stout, curved, and pectinate, about as long as the lamellar hairs. Pseudostigma funnel-shaped, projecting about one-half its length above surface of cephalothorax; pseudostigmatic organ about as long as tibia of leg one, strongly clavate and directed forwards.

Abdomen globose; pteromorphæ attached to the anterior two-thirds of the lateral margin, truncate in front and not extending beyond the anterior margin of abdomen, anterior free edge concave. Genital covers subrectangular, almost as large as anal covers and situated one and one-half times their length in front of the latter. Anal covers situated almost approximate to the posterior margin of the ventral plate. Abdomen hairless.

Anterior pair of legs three-fourths as long as abdomen; tarsus slightly longer than tibia. Legs bearing prominent pectinate bristles. No tactile hair on tibia one. Unguis tridactyle.

Length, 0.39 mm.; breadth, 0.30 mm.

Under logs. Collected by the writer at Urbana, Illinois. One specimen.

Oribata subaquila n. sp.

(Plate XV., Fig. 19.)

Chestnut brown; integument of medium thickness, surface almost smooth.

Cephalothorax about two-thirds as broad as long; lamellæ prominent, about two-thirds as long as cephalothorax, narrow at the posterior part, the anterior part being about one-fourth as broad as the lamellæ are long; lamellæ with prominent cusps; translamellæ incomplete, being interrupted medially. Lateral lamellæ present, three-fifths as long as cephalothorax, very narrow. A rather prominent tectopedium for leg one is present. Lamellar hairs simple, straight, directed forwards and somewhat longer than the lamellæ from which they extend. Interlamellar hairs situated approximate to posterior margin of cephalothorax, similar to lamellar hairs. The anterior lateral hairs spring from the lateral lamellæ. They are stout, pectinate, almost straight and about as long as the lamellæ. Pseudostigma funnel-shaped, extending one-third its length above the surface of cephalothorax; pseudostigmatic organ two-thirds as long as lamellæ, clavate, dentate, directed forwards and away from median plane.

Abdomen about three-fifths as broad as long, pteromorphæ attached to the anterior two-thirds of the abdomen, truncate in front and not extending quite to the anterior margin of abdomen; anterior free edge of pteromorphæ straight. Genital covers almost rectangular, slightly broader anteriorly than posteriorly, situated about one and one-half times their length in front of the larger anal covers. Anal covers half as long again as genital covers, triangular and situated almost approximate to the posterior margin of ventral plate. Abdomen hairless.

Anterior pair of legs a little longer than the cephalothorax; tarsus and tibia subequal. Tactile hair of tibia one, situated at the dorsal, distal aspect of segment, about three times as long as the segment itself. The femur of leg two bears on its lateral surface a small, narrow blade with a large cusp at its distal end. This blade is represented in the femur of leg one by a small chitinous ridge with a small process at its distal end. The legs each bear several stout, curved, pectinate bristles. Unguis tridactyle.

Length, 0.42 mm.; breadth, 0.26 mm.

Under bark and in moss. Collected by the writer at Urbana, Illinois. Many specimens.

***Oribata clavata* n. sp,**

(Plate XV., Fig. 20.)

Light brown; integument of medium thickness, surface smooth.

No demarcation between cephalothorax and abdomen. No median lamellæ, but a pair of narrow, lateral lamellæ which arise at the pseudostigmata and extend about two-thirds the distance to the tip of the cephalothorax. Lateral lamellæ broadest at the posterior end and gradually narrowing anteriorly until they disappear. No translamella. No lamellar hairs or anterior lateral hairs. Interlamellar hairs situated almost in front of pseudostigmata, about as long as the pseudostigmatic

organ and pectinate. Pseudostigmata funnel-shaped ; pseudostigmatic organs clavate and slightly recurved.

Abdomen about two-thirds as broad as long ; pteromorphæ triangular and not extending beyond the base of the cephalothorax ; they are about one-third as long as the abdomen. Dorsum of abdomen bearing about a dozen stout, slightly curved, pectinate bristles. Genital covers twice as long as broad and situated about one and one-half times their length in front of the anal covers.

Legs short ; anterior pair about three-fifths as long as the abdomen. Tarsus and tibia subequal. Unguis tridactyle.

Length, 0.56 mm. ; breadth, 0.42 mm.

Under old pieces of wood. Collected by the writer at Arcola, Illinois. A few specimens.

Gen. **ORIBATELLA** Banks.

No large, spatulate hairs on the dorsum of the abdomen ; tarsus of leg one tapering at the distal end, not broadened. Lamellæ large and attached to the dorsal surface of the cephalothorax by their posterior margins only.

One species.

Oribatella magnilamellata n. sp.

(Plate XV., Figs. 21, 22.)

Dark chestnut brown ; integument thick, surface smooth.

Cephalothorax rather small, triangular and almost entirely hidden by the broad, long lamellæ ; lamellæ very large, extending the entire length of the cephalothorax and projecting slightly beyond the tip of the rostrum, one-third as broad as long, notched in front. From the lateral corner of the lamella extends a sharp curved cusp ; from the median corner extends a very stout, slightly pectinate bristle curving slightly towards the median plane, and as long as the lamella is broad. One pair of tectopodia present which are one-half as long as the lamella. Interlamellar hairs long, curved, slightly pectinate, as long as the lamellæ themselves and situated at the base of the lamellæ ; anterior lateral hairs about two-thirds as long as interlamellar hairs, strongly curved and pectinate. Pseudostigmatic organ somewhat longer than femur one, strongly clavate, directed forwards and towards the median plane.

Abdomen two-thirds as broad as long ; pteromorphæ about one-half as long as abdomen, truncate in front and not projecting beyond the anterior margin of abdomen. Anterior free margin of pteromorphæ convex. Genital covers subrectangular, of equal breadth throughout, somewhat smaller than the anal covers, and situated twice their length in front of the latter. Anal covers subtriangular in shape, much broader

posteriorly than anteriorly and situated one-half their length from the posterior margin of ventral plate. Abdomen with a few fine hairs.

Anterior pair of legs as long as abdomen; tarsus slightly longer than tibia; genual two-thirds as long as tibia: femur almost three times as long as genual. Tactile hair almost twice as long as tarsus. Unguis tridactyle; dactyles unequal.

Length, 0.37 mm.; breadth, 0.24 mm.

Under bark. Collected by the writer, Urbana, Illinois. Many specimens.

Fam. NOTHRIDÆ.

With specialized seta arising from a pore on each side of the dorsal surface of the cephalothorax near the posterior margin. Abdomen immovably fused with cephalothorax and without pteromorphæ. Segments of legs often stout, sometimes swollen.

Gen. **NEOLIODES** Berlese.

Cephalothorax without lamellæ; legs short and stout; abdomen without transverse suture; dorsum of abdomen convex, and carrying nymphal skins showing concentric rings; unguis tridactyle.

One species.

Neoliodes concentrica Say (?).*

(Plate XVI, Figs. 23, 24, 25, 26.)

* I think it would hardly be possible for any one to determine this species from Say's description in Jour. Phila. Acad., vol. ii, 1821, p. 73. Most of the characters given in this description are either generic or are based upon erroneous ideas of the anatomy of the acarina, as for example, his reference to the eyes as being "Two, minute, brownish, elevated on an elongated, slender filiform peduncle." This reference is evidently to the pseudostigmatic organs.

Since I found that my specimens did not agree with Banks' figure of *concentrica* on page 72 of his treatise on the acarina, at first I thought it was new. Recently I have found this species in Wisconsin and many places in Illinois, always under bark. Mr. J. D. Hood has also sent me specimens of it taken from under bark in Michigan. I would infer from this that the species probably has a general distribution over the United States, and since it has always been found under bark and is the only common species of the genus found in this situation in this country it likely is Say's species, for he found *concentrica* only under bark. If it should prove in the future to be new, I would suggest that it be named after Mr. Hood, who first found the species in the middle part of the continent.

Dark brown; integument thick, leathery, rough, tuberculate.

Cephalothorax triangular, about three-fifths as broad as long, dorso-vertex very rough, the integument being thickened in places as to form ridges. There is a pair of stout, short, curved, clavate anterior lateral bristles which extend upwards and towards the median plane. Pseudostigma low, cylindrical; situated at the extreme, posterior latero-dorsal aspect of cephalothorax; pseudostigmatic organ short, strongly clavate, about as long as femur one is broad.

Cephalothorax about three-fifths as broad as long; elongate and pointed posteriorly; dorsum has four areas concentrically arranged and at different levels in a stair-step fashion, the outer area being at the bottom and the inner at the top; areas of same shape which is that of the abdomen itself. Three pairs of stout, clavate, bristles are situated on the posterior margin of the abdomen near the median plane. The inner pair is very large, being longer than the tarsus of leg four, middle pair not quite one-half as long as the median pair, the outer pair is the smallest, being not quite as long as the middle pair; abdomen otherwise hairless. Ventral plate triangular, a little longer than broad; genital covers larger than anal covers, each about twice as long as broad and with a straight median margin and a convex lateral margin; genital covers situated almost approximate to the anterior margin of ventral plate and the anterior margin of the anal aperture; anal covers about three times as long as broad, much broader anteriorly than posteriorly.

Legs short and stout; anterior pair not quite as long as abdomen; tibia a little longer than tarsus: each leg with several short, stout, usually slightly curved, clavate bristles. The tarsus of each leg has several small, straight, simple hairs, and the tibia a few of such hairs. Unguis stout, strong, tridactyle; dactyles equal.

Length, 1.04 mm.; breadth, 0.52 mm.

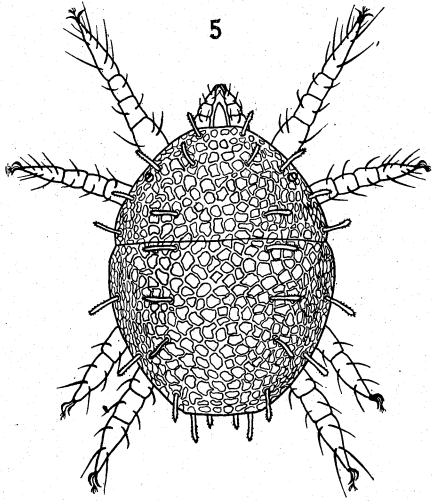
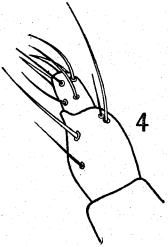
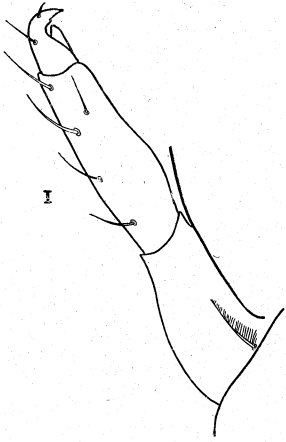
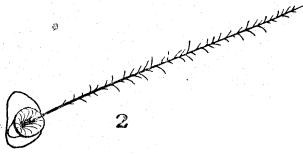
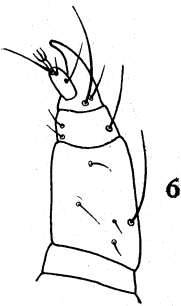
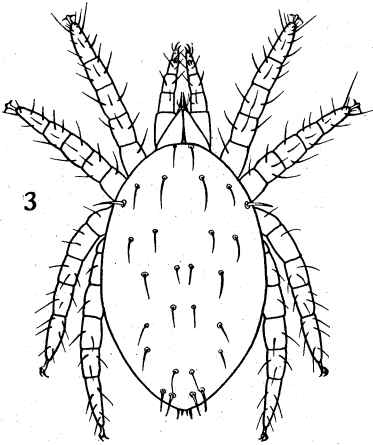
Under hickory bark. First collected by J. D. Hood, Urbana, Illinois. Many specimens.

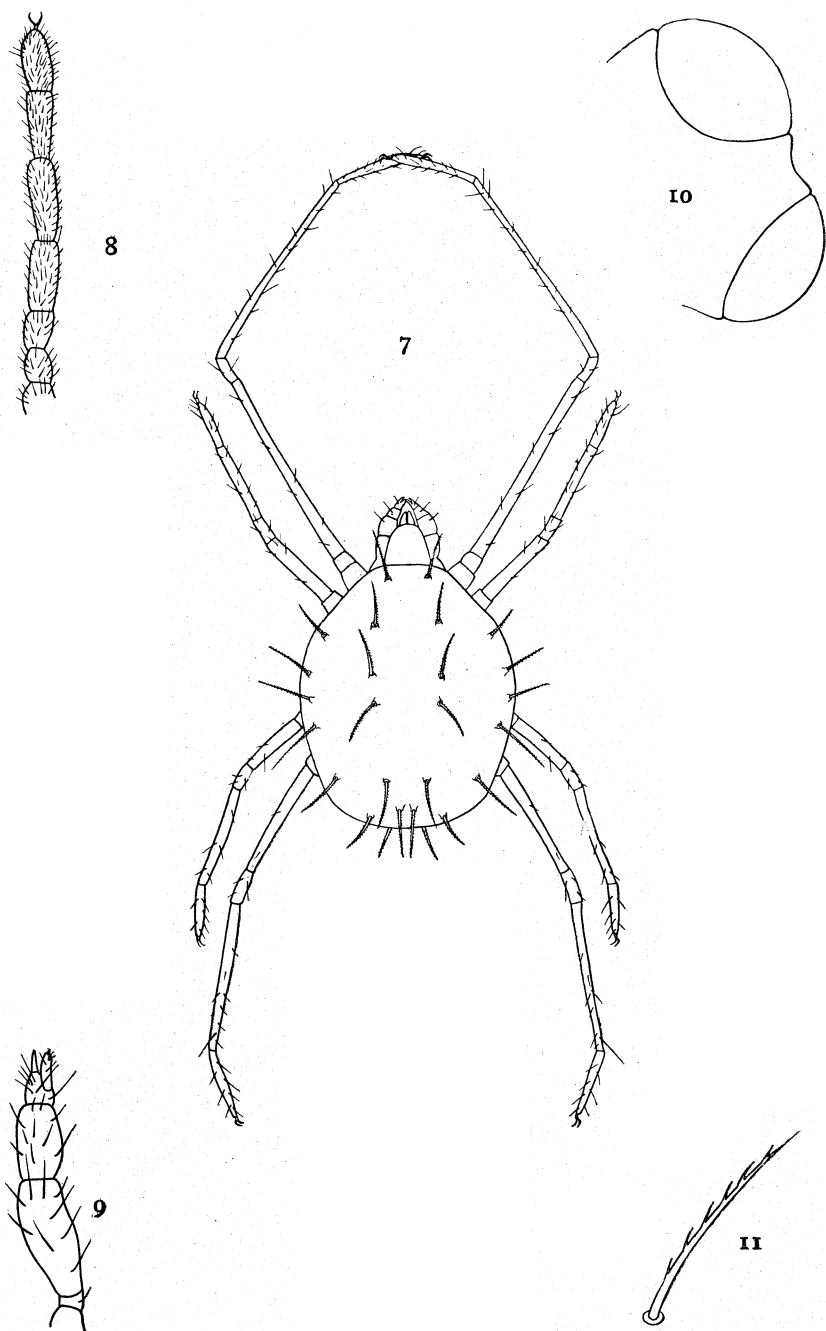
Fam. HOPLODERMIDÆ.

With a specialized setæ arising from a pore near each postero-lateral corner of cephalothorax; cephalothorax hinged to abdomen and capable of being folded down over the ventral surface of the same; body compressed; integument not strongly chitinated.

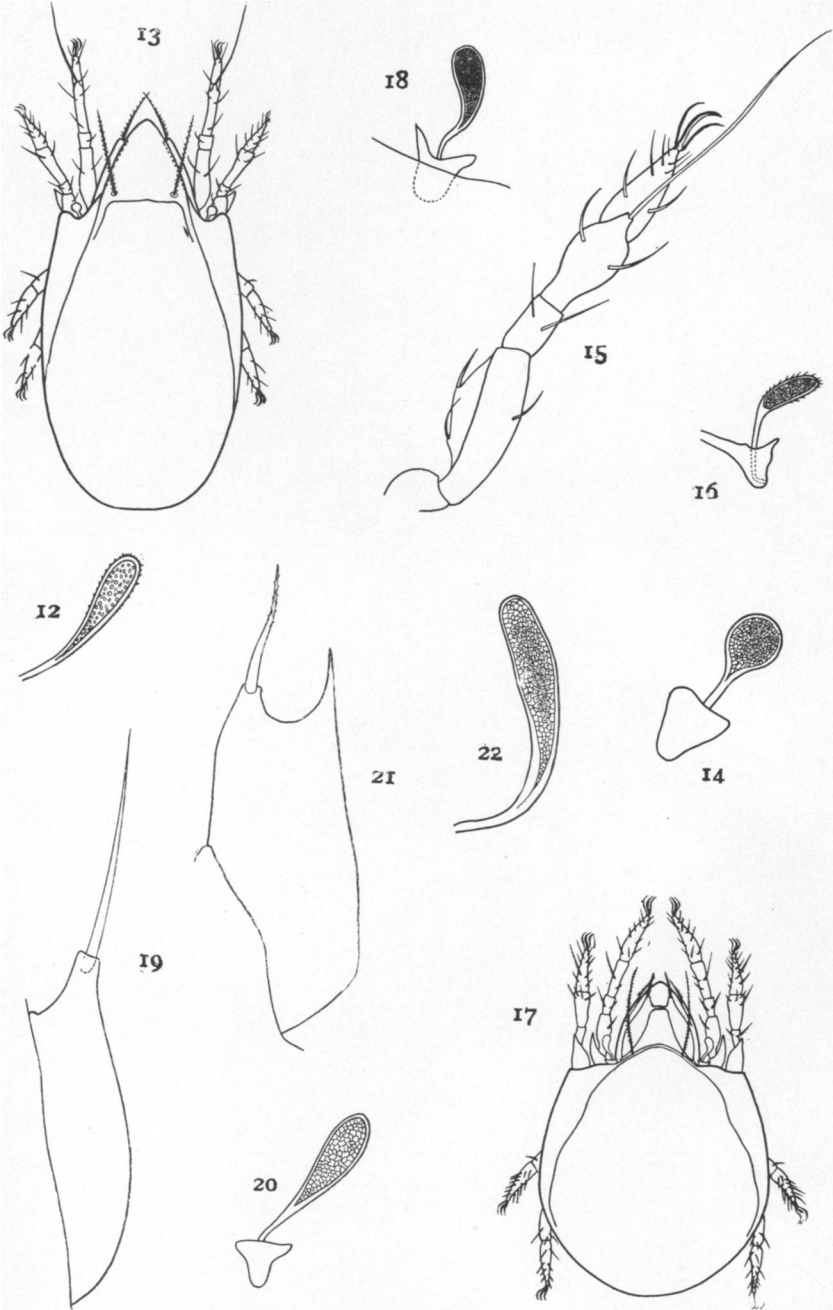
Gen. HOPLODERMA Michael.

Unguis monodactyle; genital and anal covers separated from each other.



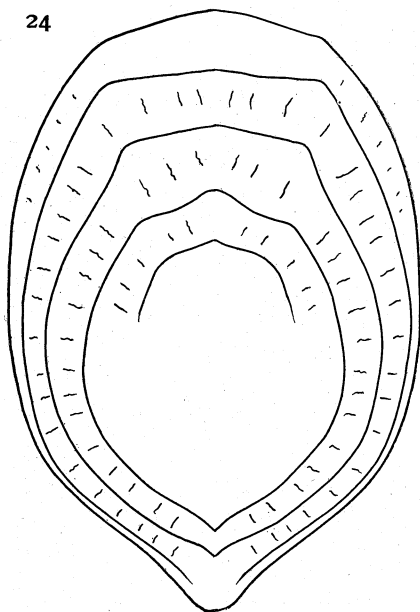


EWING ON NEW ACARINA.



EWING ON NEW ACARINA.

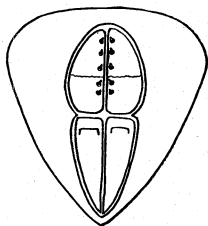
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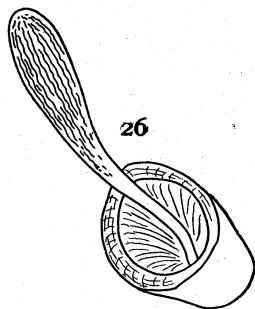
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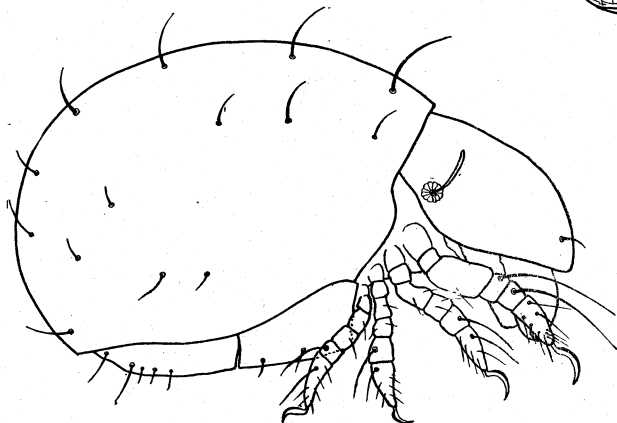
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27



EWING ON NEW ACARINA.

Hoploderma lurida n. sp.

(Plate XVI., Fig. 27.)

Light brown, with a pea-green tinge; integument of abdomen and cephalothorax very finely pitted.

Cephalothorax about one-half as long as abdomen and one-half as high as long. Pseudostigma round, flat, with radiating ridges, its diameter equals the width of femur one, situated approximate to the posterior ventral margin of dorso-vertex; pseudostigmatic organ long, narrow, slightly clavate, as long as femur of leg one. When the cephalothorax is extended, the dorsum of abdomen projects but slightly over the posterior margin of the former. Mandibles and palpi large and prominent. Cephalothorax with a single pair of hairs near the anterior margin.

Abdomen about two-thirds as high as long, rounded at its posterior end, anterior margin somewhat concave; dorsum of abdomen bearing about a dozen pairs of rather long, straight, simple bristles. Genital and anal covers large and close together.

Legs all about the same length, but the anterior pair is stouter than the rest; tibia of leg one slightly over one-half as long as tarsus; genu almost as long as tibia; femur more than twice as long as genu. The tarsus and tibia, especially of the first pair of legs, bear rather prominent straight hairs. Unguis monodactyle and almost as long as the tarsal segments from which they extend.

Length, 0.82 mm.; height, 0.46 mm.

Under bark. Collected by the writer at Urbana, Illinois. One specimen.

EXPLANATION OF PLATES.

PLATE XIII.

Fig. 1.—*Eupalus pectinatus*, n. sp., left, palpus, x 342.

Fig. 2.—*Eupalus pectinatus*, hair arising from pore on the posterior dorsal aspect of the cephalothorax, x 342.

Fig. 3.—*Caligonus cardinalis* n. sp., x 85.

Fig. 4.—*Caligonus cardinalis*, distal end of palpus, x 550,

Fig. 5.—*Raphignathus tessellatus* n. sp., x 85.

Fig. 6.—*Raphignathus tessellatus*, right palpus, x 342.

PLATE XIV.

Fig. 7.—*Neophillobius harti* n. sp., x 60.

Fig. 8.—*Rhyncholophus tumidus* n. sp., x 60.

Fig. 9.—*Rhyncholophus longipalpus* n. sp., right palpus, x 195.

Fig. 10.—*Microtrombidium nigrum* n. sp., eyes and eyestalk, x 550.

Fig. 11.—*Microtrombidium nigrum*, hair from body, x 550.

PLATE XV.

Fig. 12.—*Pelops latipilosus* n. sp., pseudostigmatic organ, x 342.

Fig. 13.—*Gymnobates longus* n. sp., x 97.

Fig. 14.—*Gymnobates longus*, pseudostigma and pseudostigmatic organ, x 550.

Fig. 15.—*Oribata laminata* n. sp., leg one, x 342.

Fig. 16.—*Oribata laminata*, pseudostigma and pseudostigmatic organ, x 342.

Fig. 17.—*Oribata figurata*, n. sp., x 97.

Fig. 18.—*Oribata figurata*, pseudostigma and pseudostigmatic organ, x 550.

Fig. 19.—*Oribata subaquila* n. sp., lamella and lamellar hair, x 550.

Fig. 20.—*Oribata clavata* n. sp., pseudostigma and pseudostigmatic organ, x 550.

Fig. 21.—*Oribatella magnilamellata* n. sp., lamella and lamellar hair, x 550.

Fig. 22.—*Oribatella magnilamellata* n. sp., pseudostigma and pseudostigmatic organ, x 550.

PLATE XVI.

Fig. 23.—*Neoliodes concentrica* Say, leg one, x 85.

Fig. 24.—*Neoliodes concentrica* Say, cast nymphal skin from the dorsum of the abdomen, x 85.

Fig. 25.—*Neoliodes concentrica* Say, ventral plate, genital and anal covers, x 60.

Fig. 26.—*Neoliodes concentrica* Say, pseudostigma and pseudostigmatic organ, x 342.

Fig. 27.—*Hoploderma lurida* n. sp., x 85.